

John L. Bowman, Ph. D.

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Activity-Based Model Research and Development for Copenhagen, Denmark

Danish Council for Strategic Research and
Technical University of Denmark (DTU)

Date: 2011-present

Contact 1 (AB model development project leader): Goran Vuk (gjv@vd.dk)

Contact 2 (project manager): Christian Overgård Hansen (coh@transport.dtu.dk)

John Bowman is collaborating with Danish researchers in development of an advanced AB model system with emphasis on intra-household interactions, at-home family priority time, non-motorized and public transport, and disaggregate assignment. During this work Bowman has resided in Copenhagen for five months in each of 2013 and 2014.

Research on Incorporating Bicycling into Activity-based Regional Travel Forecasting Models in Denmark: Identified Needs and Proposed Solutions

Danish Road Directorate (Vejdirektoratet) and
Technical University of Denmark (DTU)

Date: 2013

Contact (Vejdirektoratet): Goran Vuk (gjv@vd.dk)

Contact (DTU): Christian Overgård Hansen (coh@transport.dtu.dk)

While residing temporarily in Copenhagen, Denmark, John Bowman conducted research to (a) learn about the nature and role of bicycling as a transport mode and policy issue through field visits and interviews, (b) evaluate the capabilities and limitations of the AB model under development, (c) design enhancements that would enable the model to better represent bicycle-related behavior and address bicycle policy issues, (d) identify the data needs, (e) lay out a strategy for implementing data and model improvements, and (f) produce a white paper covering all aspects of the conducted research.

Research for FHWA to Make Advanced Travel Forecasting Models Affordable Through Model Transferability

FHWA Office of Planning

Date: 2011 – present

Contact: Supin Yoder, Technical Representative

Phone: 708-283-3554

John Bowman, Mark Bradley and Joe Castiglione are conducted research to empirically test and demonstrate the transferability of advanced (activity-based, or “AB”) models between regions. Using current data obtained through the 2008-2009 National Household Travel Survey “add-on” program, Bowman and Bradley estimated advanced activity-based models simultaneously for six regions in California and Florida. Statistical tests were applied to identify regional differences in the model coefficients. A final report documented all findings.

In a second phase of the project, Bowman and Bradley are extending the work to include seven additional regions in other states, and conducting additional analyses to enhance the usefulness of the research.

Modeling of Bicycle and Pedestrian demand for NCHRP

NCHRP

Date: 2010 – 2014

Contact: Nanda Srinivasan, Program Director

Phone: 202-334-1896

As a subcontractor to J. Richard Kuzmyak, Bowman assisted Mark Bradley to develop improved methods for estimating bicycling and walking in the context of AB models.

Activity-Based Model Design and Development for Seattle

Puget Sound Regional Council (PSRC), Seattle, WA

Date: 2008 – 2014

Address: 1011 Western Avenue, Suite 500, Seattle, Washington 98104

Contact: Suzanne Childress, Senior Modeler

Phone: 206-971-3282

Bowman prepared a design and work plan for the development of an activity-based travel model system and assisted Bradley and Castiglione in the creation of an activity generator component to replace PSRC current trip generation models. This project represented an initial phase in a series of mid-term model improvements intended to replace the current land use and travel demand models with an integrated land use and activity-based travel forecasting model. The work plan and development program identified desired model components and specified associated tasks, schedules, and budgets necessary for the complete integration of the activity model system with the PSRC’s existing land use model system. The activity generator was designed, developed, and implemented as a disaggregate microsimulation model that replaces the current set of aggregate trip-based generation models. The activity generator was estimated, calibrated, and validated using the PSRC 2006 Household Activity Survey, and implemented within the existing trip-based model framework.

With Mark Bradley, DKS, RSG and PSRC staff, Bowman implemented an activity-schedule-based travel demand model system (DaySim) for Puget Sound Regional Council. Bowman served as technical project manager, principal designer (with Bradley), and principal model developer (with Bradley and Suzanne Childress).

Activity-Based Model Planning and Design Services for Florida DOT and SCAG

Date: 2008

Bowman and Bradley conducted planning projects for Florida DOT Region 7 (Tampa Bay area) and Southern California Association of Governments (SCAG) to explain the state of the practice, present a recommended design and prepare preliminary implementation plans for their subsequent implementations of activity-based model systems.

Activity-Based Travel Forecasting Model for Sacramento

Sacramento Area Council of Governments (SACOG), Sacramento, CA

Date: 2005 – 2008; 2011

Address: 1415 L Street, Suite 300, Sacramento, CA 95814

Contact: Gordon Garry

Phone: 916-340-6230

Bowman and Bradley designed, developed, programmed and implemented a new activity-schedule-based travel demand model system for Sacramento Area Council of Governments. The system features an integrated econometric microsimulation of personal activities and travel with a highly disaggregate treatment of the purpose and time of day. Bowman was the primary developer of the location choice models for usual work and school locations, tour destinations, and intermediate stop locations, all of which use parcels as the choice alternatives, and parcel attributes to explain the choices. This work was completed during 2005 with fixed dollar contracts totaling \$200,000. We encountered a three-month delay at the very beginning because required data were not available. Completion of the software took a month longer than anticipated.

Bowman guided the integration of that system with the traffic assignment models and overall model equilibration procedures, and specified and guided the calibration procedure for the entire model system. This work was done with subcontracts totaling \$80,000 under a \$200,000 prime contract.

Bowman designed and programmed distributed processing capabilities in a small 2008 follow-up project.

In 2011, Bowman, Bradley, RSG and DKS Associates implemented a major enhancement to the model system to improve its capability with respect to pricing,

transit, and various other aspects. The AB model system was also ported onto the new DaySim model software platform.

Activity-Based Model Design and Development for Denver

Denver Region Council of Governments (DRCOG), Denver, CO
Date: 2006- 2008
Address: 4500 Cherry Creek Dr S, Suite 800, Denver, CO 80246
Contact: Erik Sabina (now with Colorado DOT)
Phone: 303-455-1000; 303-480-6789

Bowman guided the design of the new activity-schedule-based travel demand model system for Denver Regional Council of Governments, customized and implemented the ARC population synthesizer, and guided the estimation of the long-term choice model components (auto ownership, work location, school location) by DRCOG staff. This work was done under fixed dollar subcontracts to prime contractor Cambridge Systematics.

Model Research, Design and Development Services for Atlanta

Atlanta Regional Commission, Atlanta, GA
Date: 2001 - 2007
Address: 40 Courtland St, NE, Atlanta, GA 30303
Contact: Guy Rousseau, Transportation Planning Division
Phone: 404-463-3274

Bowman co-designed (with Bradley and Vovsha) a new activity-based travel demand model system for Atlanta Regional Commission and participated in model component estimation. A critical first element involved the specification and implementation of a flexible validatable population synthesizer that was subsequently adopted in other regions (San Francisco and Denver). Bowman designed the population synthesizer, wrote the core logic, guided the programming, implemented it, trained the user, and integrated it into ARC's existing trip-based model system. (Bowman subsequently helped Denver Regional Council of Governments, Puget Sound Regional Council and San Diego Association of Governments to implement it for their regions.) Bowman also researched for ARC the current state of the practice in land use modeling. This work was done under annual, usually small, fixed dollar subcontracts to PB and PBS&J. The client determined an annual fixed budget, and the prime contractor established the work scope based on these resources.

Academic Research and Teaching at MIT

Massachusetts Institute of Technology
Date: 1994-2007

Address: Cambridge, Massachusetts

Contact: Moshe Ben-Akiva, Edmund K. Turner Prof. of Civil & Env. Engineering

Phone: 617-253-5324

For Masters thesis at MIT (1995), Bowman developed the first modern activity-schedule-based travel demand model: designed it, processed all survey data, estimated all models, demonstrated the feasibility of developing an integrated activity-based model system, and demonstrated the correlation of activity schedule choices with transport level of service. For his PhD thesis at MIT (1998), improved and formalized the activity schedule model, emphasizing (a) the influence of activity accessibility on activity participation, at-home vs on-tour decisions, trip chaining and inter-tour trade-offs, and (b) the influence of lifestyle on activity and activity pattern utility. Implemented the activity pattern model for Portland, Oregon. He also developed an integrated discrete choice model system of a household's residential location choice and its members' activity and travel schedules, demonstrating how activity-based accessibility impacts residential location. Bowman served as teaching assistant, and occasionally as substitute instructor for the core graduate demand modeling course.